A Deadly Combination: Integration of the AH-64D M-TADS and High Altitude Tactics on the Modern Urban Battlefield

Submitted by Captain A.C. Schilleci
to
Major J.M. Weis, CG 10

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1. Introduction.

"The modernization of MTADS has changed the way we fight and has given our unit a level of effectiveness that we believe will alter all Attack Battalions and Attack Reconnaissance Battalions."[1]

Some might read the preceding quote and arrive at the conclusion that all Apache Battalions exude an unfounded level of arrogance. One might even question if any single attack aviation unit can even make a significant contribution to [the progress of] the Global War on Terror. To the surprise of many, the integration of the Arrowhead® M-TADS/PNVS[2] into the AH-64D Longbow Attack Helicopter platform has established technological advancements and has significantly shifted the inherent realities of combat in which we now live.

What has been proven during the last Operation Iraqi Freedom deployment (06-08), is the application of M-TADS

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[1] Adams, Gerald E., Chief Warrant Officer Four, United States Army and Lieutenant Colonel David M. Fee. "MTADS – More Than Just a Sensor." U.S. Army Aviation Center Tactics Division Newsletter Feb. 2007: 4+.

[2] MTADS: Modernized Target Acquisition and Designation Sight, Business Development, Missiles and Fire Control, Lockheed Martin Corporation. "Arrowhead® (M-TADS/PNVS)." *Modernized Target Acquisition and Designation System Product Information Publication.* Washington: 2007.

High Altitude Tactics must be more effectively integrated into attack helicopter (AH) operations to improve the current methods of AH employment, enhance aircrew survivability, and exploit known inherent insurgent vulnerabilities.

2. Current AH-64D Employment Methods.

Longbow aircrews are trained to within the parameters of the Aircrew Training Manual (ATM). The ATM has drawn from many historical lessons that influence the fundamental attack aviation tasks within. Credence has been specifically traced to the successful AH-1 tactics utilized while flying and fighting in the jungles and hills of Vietnam. Still forty years later, the primary method in which aircrews plan tactical missions stem from the fundamentals of the ATM Task 1408, "Perform Terrain Flight."[3]

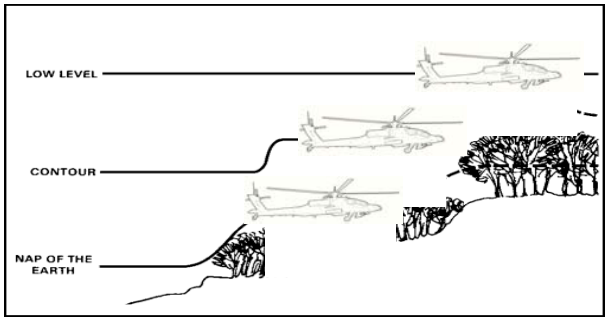
2.1. Performing Terrain Flight.

ATM Task 1408 is divided into two subtasks that maintain the standards for terrain flight. (see Fig 1.).

[3] Headquarters, US Army Training and Doctrine Command. TC 1-251, *Aircrew Training Manual, Attack Helicopter (AH-64D).* Washington: September 2005.

The first, terrain flight modes, (contour, low-level, and Nap of the Earth [NOE] flight,) describe the different aircraft altitudes and movement considerations to the earth's surface enroute to target areas in which AHs are utilized.

(Fig. 1) Terrain Flight Modes[4]



2.2. Employment of Techniques of Movement and Principles of Overwatch.

Techniques of Movement and Principles of Overwatch, (traveling, traveling overwatch, and bounding overwatch,) are designed to capitalize on the maneuverability of helicopters while employing the fire and maneuver concept.[5]

This primary task is introduced to fledgling attack pilots during initial training at Fort Rucker and hammered home once the aviator reaches his/her operational Attack Reconnaissance Battalion (ARB). Joint doctrinal

[4] Fig. 1. Headquarters, US Army Training and Doctrine Command. FM 1-112, *Attack Helicopter Operations.* Washington: April 1997.

[5] TC-251, 4-151.

considerations applied to attack aviation employment in the current urban combat environment also remain tied to the traditional low-level mindset. For example, a typical rotary-wing urban flight profile consists of modified low-level and contour techniques.[6] In order to establish a foundation for employing attack helicopters in support of the missions in the Contemporary Operating Environment (COE), the "low and fast" mindset must be shifted.

2.3. Lack of High Altitude Training in Current Doctrine.

Conversely, during no time in flight school or during a readiness level progression will a new gun pilot find any ATM standardized task for "Perform High-Altitude Flight." This specific tactical task, which has proven to be the new foundation of success for attack aviation operations in executing the war on terror; is missing from the current AH-64D ATM, dated September of 2005.

This startling fact has not gone unnoticed. Senior–level Army Aviation leadership and the Department of Army Aviation Evaluation and Standardization (DES) have begun to

[6] Headquarters, US Army Training and Doctrine Command, (3-06.1). Headquarters, Marine Corps Combat Development Command, (MCRP 3-35.3A). Navy Warfare Development Command, (NTTP 3-01.04). HQ Air Force Doctrine Center, (AFTTP [I] 3-2.29). *Aviation Urban Operations.* Virginia: July 2005.

take note of this critical gap in our mission-focused curriculum and Aircrew Training Program. There has been some stunning headway made in implementing these combat-tested lethal tactics. "Overall, the M-TADS allowed our unit to progress at a faster rate than a legacy TADS."[7]

3. Aircrew Survivability.

> Years of intensive training, institutional knowledge, and safety procedures have prepared our pilots to be the best low-level pilots in the world. When combat requires that they change their tactics, however; that mindset can become a fatal attraction.[8]

The insurgent enemy has once again influenced the undercurrents of attack aviation tactics. These currents are driven by the many methods [ranging from ingenious to rudimentary] in which the enemy chooses to apply friction on the battlefield. "To operate in a low-altitude environment, an Attack Weapons Team (AWT) must beware of essentially six threats: terrain, wires / power lines, rocket propelled grenades (RPGs), small arms / light machine guns and Man Portable Air Defense Systems

[7] CW4 Ed Adams and LTC Dave Fee, M-TADS More Than Just a Sensor.

[8] Slife, Jim, Colonel, United States Army. "Shootdown Solution." *Armed Forces Journal.* June 2007. URL:<http://www.armedforcesjournal.com/2007/06/2649720>. Accessed 14 December 2007.

(MANPADS)."[9] To overcome this barrage of natural/man-made obstacles and the inherent danger of low-level flight, high altitude tactics has now statistically been proven to be the necessary answer.

3.1. Safer to Fly Higher?

Varying degrees of increased altitudes are correlated with the mitigation of potential threats. Above ~500 feet, obstacle avoidance is accomplished. Climb to 1,500 feet and RPGs become out-ranged. Still higher, to 3000 feet and the Probability of Hit (Ph) of a small-arms (7.62mm AK-47), or light machine gun (12.7 DsHK) weapon system becomes dramatically reduced.[10]

The idea of flying higher to conduct aviation combat operations in an urban environment in the Joint world is also unrealistically documented and skewed. "To buffer obstacle and hazard clearance, a higher flight altitude (300 to 500 feet AGL) over a city, day or night may be necessary."[11] This altitude range places aircraft in the effective engagement envelopes of ALL weapon systems currently in the OIF/OEF theatres of operations. If an AWT crew (AH-64D or AH-1W) were to follow this planning

[9] COL Jim Slife, Shootdown Solution.
[10] COL Jim Slife, Shootdown Solution.
[11] 3-06.01, III-11.

guidance, the results could be an absolute disaster. Brig. Gen. Robert "Boomer" Milstead, a Cobra pilot who recently returned from commanding a Marine Aircraft Wing in Iraq claims: "Above about 2,500 or 3,000 feet, you are out of small arms range, by all means avoid 500 to 1,000 feet because you're hanging out there like a grape, to be picked!"[12]

3.2. "Wolfpack" Leading the HAT Transformation.

There are Attack Reconnaissance Battalions emerging who have begun the process of integrating high altitude tactics fundamentals to preserve combat power, mainly through tactical lessons learned in theatre and many airframes sustaining battle damage. 1-82 ARB, "Wolfpack", returned from OIF rotation 06-08 and is leading the shift in HAT employment. The following statement supports the application of high-altitude tactics for the sole reason of aircrew survivability: "We flew low and fast to try to avoid taking fire. In the first three months of OIF, we

[12] Eshel, David, Colonel, United States Army. "Deadly Scourge of the US Helicopter Pilots in Iraq." *Defense Update News Analysis.* 2007. URL:<http://www.defense-update.com/newscast/0207/analysis/analysis-10020.htm.> Accessed 14 December 2007.

had 12 aircraft shot; all at 400 feet and below and none at 1,000 feet and above."[13]

4. Exploiting Insurgent Vulnerabilities.

As stated in Chapter One of FM 3-24, *Counterinsurgency*, the eight highlighted insurgent vulnerabilities are:[14]

- Insurgents' need for secrecy
- Inconsistencies in the mobilization message
- Need to establish a base of operations
- Reliance on external support
- Need to obtain financial resources
- Internal divisions
- Need to maintain momentum
- Informants within the insurgency

Realistically, these vulnerability tenants are tailored to be interpreted by a Ground Force Commander (GFC) and when applied, support his scheme of maneuver. However, the M-TADS at high altitudes can effectively be just the precision weapon the GFC needs to properly leverage his air assets. "We have engaged the enemy repeatedly at high altitude with the greatest of success. Enough height to separate from the enemy, see into urban

[13] CW4 Ed Adams and LTC Dave Fee, M-TADS More Than Just a Sensor.

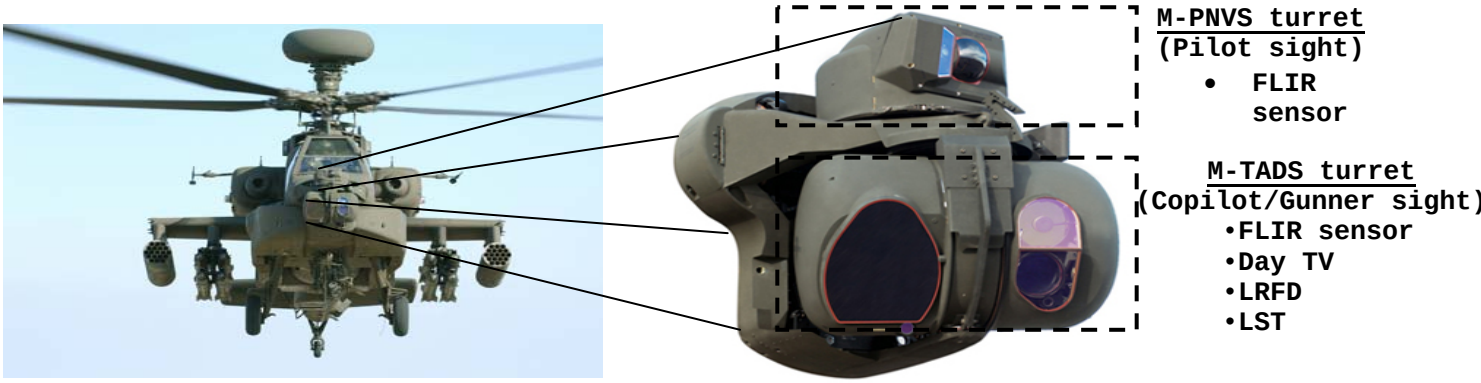
[14] Headquarters, US Army Training and Doctrine Command, (Headquarters, Marine Corps Combat Development Command). FM 3-24 (MCWP 3-33.5) *Counterinsurgency*. Washington: December 2006.

canyons, palm groves and over walls, but just below coordinating altitude."[15]

4.1. M-TADS= The Answer.

The major factor enabling this 1-82 ARB to employ high altitude tactics so effectively was the introduction of the M-TADS. "The Arrowhead® FLIR M-TADS targeting system incorporates component technology and software algorithms that were developed for the Comanche platform."[16] The M-TADS/PNVS provides the aircrew a clear 2nd generation FLIR image at ranges greater than eight kilometers (see Fig. 2.)[17]

(Fig. 2) Lockheed-Martin Arrowhead



[15] CW4 Ed Adams and LTC Dave Fee, M-TADS More Than Just a Sensor.

[16] Lockheed-Martin, Arrowhead® (M-TADS/PNVS) product information paper.

[17] Fig. 2. Lockheed-Martin, Arrowhead® (M-TADS/PNVS) product information paper.

This never-seen-before stand-off capability is precisely why and how the Wolfpack was able to climb to safe altitudes above 2,500 feet in the Salah al Din and Diyala Provinces and account for approximately 40% of 25th Infantry Division's worth of enemy BDA. The level of combat power unleashed by the capability of the M-TADS not only provided 25th ID senior leadership a tremendously deadly maneuver asset; but also significantly increased the levels security and safety for the forces on the ground.

4.2. Limitations with Current Methods.

The inherent limitation of being in the sky, unable to feel and absorb the intangibles of urban ground combat has been a reality check for attack pilots. Until now, the lack of FLIR image clarity provided by the legacy TADS attributed to gaps in pilot's situational awareness of the forces below. When flying at altitudes above 2,500 feet, the M-TADS provides the aircrew the ability to observe enemy vehicle / weapon types, facial expressions, body language and the actual wires used by insurgents to trigger improvised explosive devises. As stated by an aviator assigned to Task Force Wolfpack: "Our experience in OIF

with respect to acquiring and engaging the bad guys and with the M-TADS is seriously like cheating!"[18]

5. Counterarguments: (M-TADS and High Altitude Tactics).

Although there are many advantages to applying the HAT concepts to Army Attack Aviation, there are some intrinsic issues of concern. First, when operating at these high altitudes, the most dangerous and prevalent threat to an AWT becomes the Man Portable Air Defense Systems (MANPADS). Currently in theatre, AH aircrews face a variety of these weapons systems ranging from the Vietnam era SA-7 Grail to it's successor, the IR homing SA-14 Gremlin. More hazardous still, is the UV/IR/two-color guided SA-18 Gimlet.[19] (reference MANPADS capabilities chart [Fig. 3] below).

System	SA-7	SA-14	SA-16	SA-18
warhead (WH)	.37 kg HE/FRAG	1 kg HE/FRAG	2 kg HE/FRAG	2.5 kg HE/FRAG
(WH) initiation	contact/graze	contact/graze	Contact/graze	laser prox fuse w/in 5m
Range (max)	4200m	4500m	500-5000m	500-6000m
altitude (max)	2300m	3000m	3500m	10-3500m
Sensor	IR homing	IR homing	Passive IR/UV	passive IR/UV
Self-destruct	15 seconds	14-17 seconds	14-17 seconds	14-17 seconds

[18] Lavalley, Jamie. Personal Interview. 04 December 2007.

[19] Fig. 3. Defense Update.com. *"Igla-S, Igla-1, SA-16/18."* URL:<http://defense-update.com/products/s/sa-18.htm>. Accessed 16 December 2007.

max speed (mps)	500 mps	520 mps	400 mps	400 mps

5.1. What About Tomorrow?

A shift to the conventional battlefield would include a high probability of facing integrated air defense systems and much more definitive enemy personnel and equipment. In this scenario, the capabilities of the MTADS would still be extremely effective in attack and reconnaissance mission sets. However, the employment of HAT would doctrinally be postponed until the enemy and his IADS is neutralized and friendly air superiority is achieved.

Another potential pitfall that the Attack community must also avoid is the propensity to focus all or a majority of a unit’s training around the Contemporary Operating Environment. Mission planning for battle position and deep attack operations must remain sharp for the next significant conventional threat. Due in large part to the COE, the disconcerting trend of disregarding large-scale anti-armor mission employment considerations can be the sign of a future Achilles heel for attack aviation.

The attack helicopter community must combine the fundamental tank killing successes achieved in Operation Desert Storm with the insurgent exploitability learned and

gained in OIF/OEF with the M-TADS. Once this evolution is completely implemented and properly standardized throughout Army attack aviation, the ability to surgically strike our future armored enemies becomes limitless.

6. Conclusion.

The Army Attack community must continue efforts to standardize HAT into our Aircrew Training Program to properly integrate the recent concepts and lessons learned. The staggering achievements experienced when employing the M-TADS in combination with HAT are all the evidence needed to take particular note and standardize this deadly combination.

The senior leaders (Commissioned and Warrant Officer) will need continual exposure to these jaw-dropping concepts and success stories. Surprisingly, even in the tightly knit Apache Longbow community, the recent exploits of the M-TADS are mythical and some of the claims deemed unbelievable. However, the strides currently being made in the Army's DES coupled with the support of some key influential decision makers are already beginning to modernize our communities' view on the M-TADS HAT combination.

This progress will certainly enable further advancements and developments in risk mitigation to improve aircrew survivability. Additionally, with more pilots flying the M-TADS in conjunction with HAT daily, the amount of intelligence gathered to capitalize on exploiting the now visible weaknesses of our insurgent enemies will only improve the future of our tactics and community.

1995 words

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